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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,188	09/21/2001	Christine Connolly	013344-9027	6355

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EXAMINER	
MISLEH, JUSTIN P	
ART UNIT	**PAPER NUMBER**
2622	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/937,188	CONNOLLY ET AL.	
	Examiner	Art Unit	
	Justin P. Misleh	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 15* is/are pending in the application.

4a) Of the above claim(s) *16 - 30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 September 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 January 2007 has been entered.

Response to Arguments

2. Applicant's arguments with respect to Claims 1 – 15 have been considered but are moot in view of the new grounds of rejection.

Examiner Note

In the latest amendment (filed January 19, 2007), Applicant has appeared to amend independent Claim 1 to overcome the previous rejection and warrant new grounds of rejection (see claim rejections below). However, in amending independent Claim 1, Applicant did not amend the dependent claims to conform to the newly required limitations of the parent claim. The claim language of the dependent claims newly presents numerous antecedent basis issues. The antecedent basis issues affect the scope of the respective claims such that the scope of each of the respective claims is not "reasonably ascertainable by those skilled in the art" (see MPEP § 2173.05(e) [R-5]). Please see the 35 U.S.C. 112, 2nd paragraph, rejections below.

Claim Objections

3. **Claim 9** is objected to because of the following informalities: typographical error.

The claim language recites therein, "the image field"; when no "image field" has been previously introduced. The above-recitation appears to be a minor typographical error. For the purposes of examination, "the image field" will be interpreted as "an image field". **Appropriate correction is required.**

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 4 – 8 and 10 – 15** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. **Claim 4** recites the limitation "The method of claim 1, wherein setting a point of zero light intensity is achieved by" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim. Parent Claim 1 does not explicitly require a step of setting a point of zero light intensity"; nor does parent Claim 1 implicitly indicate any step at which it would be necessarily inherent to set a point of zero light intensity. For the purposes of examination, Claim 4 will be interpreted as follows, "The method of Claim 1, further comprising a step of setting a point of zero light intensity by closing an iris of the camera."

7. **Claim 5** also recites the limitation "The method of claim 1, wherein setting a point of zero light intensity is achieved by" in lines 1 and 2. There is insufficient antecedent basis for this

limitation in the claim. Parent Claim 1 does not explicitly require a step of setting a point of zero light intensity"; nor does parent Claim 1 implicitly indicate any step at which it would be necessarily inherent to set a point of zero light intensity. For the purposes of examination, Claim 5 will be interpreted as follows, "The method of Claim 1, further comprising a step of setting a point of zero light intensity by setting the camera to monitor a black image."

8. **Claim 6** also recites the limitation "The method of claim 1, wherein setting a point of zero light intensity is achieved by" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim. Parent Claim 1 does not explicitly require a step of setting a point of zero light intensity"; nor does parent Claim 1 implicitly indicate any step at which it would be necessarily inherent to set a point of zero light intensity. For the purposes of examination, Claim 6 will be interpreted as follows, "The method of Claim 1, further comprising a step of setting a point of zero light intensity by extrapolating from measurements obtained from two or more points of know reflectance somewhere in an image field of the camera.

9. **Claims 7 and 8** directly depend from Claim 6. By virtue of their dependency, Claims 7 and 8 also lack antecedent basis. For the purposes of examination, Claims 7 and 8 will be interpreted as they are presented.

10. **Claim 10** recites the limitation, "wherein restricting the camera to operate within the linear region is achieved by reducing the camera aperture by closing the iris to a predetermined degree such that the output voltage when measuring the source of maximum light intensity corresponds to a camera output voltage at or below the knee." Parent Claim 1 does not require "restricting the camera to operate"; an "iris"; or a "camera aperture". In fact, Claim 1 does not specify how "restricting an amount of light incidence on the sensor elements" is performed. For

this reason, there is insufficient antecedent basis for this limitation in the claim. For the purposes of examination, Claim 10 will be interpreted as follows, "The method of Claim 1, wherein restricting the amount of light incidence on the sensor elements is performed by closing an iris of the camera."

11. **Claims 11 and 12** directly depend from Claim 10. By virtue of their dependency, Claims 11 and 12 also lack antecedent basis. For the purposes of examination, Claims 11 and 12 will be interpreted as they are presented.

12. **Claim 13** recites the limitation, "wherein the step of establishing the knee is carried out less frequently than the step of establishing the offset." Parent Claim 1 does not require "establishing a knee". In fact, Claim 1 does not specify anything about a "knee". For the purposes of examination, Claim 13 will be interpreted as follows, "The method of Claim 1, wherein the step of establishing the offset is carried out as frequently as the graphing."

13. **Claims 14 and 15** directly depend from Claim 13. By virtue of their dependency, Claims 14 and 15 also lack antecedent basis. For the purposes of examination, Claims 14 and 15 will be interpreted as they are presented.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. **Claims 1 – 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Kawai et al. (US 6,141,047) in view of Sakai et al. (US 5,943,094).

16. For **Claim 1**, Kawai et al. disclose, as stated in column 3 (line 45) – column 5 (line 64) and as shown in figures 2A – 5, a method of calibrating a color monitoring system (figure 2A) including a plurality of sensor elements (CCD 3 includes a plurality of sensor elements; 31a, 31b – see figure 8) so as to compensate for non-ideal real camera characteristics ("optimal image processing is performed"; see column 5, lines 65 – 67), the method comprising:

exposing the sensor elements (see column 3, lines 51 – 53) to a known plurality of light intensities (see explanation below);

graphing a plurality of output voltages (see figure 2B – 5) of the sensor elements (31a, 31b) against the known light intensities (Kawai et al. state the graphs are based upon the histogram values generated by the evaluation circuit 10; where the evaluation circuit determines the values on the basis of image information over one frame. Accordingly, the CCD output voltages are effectively graphed versus input light; see column 3, lines 62 – 67; column 4, lines 51 – 62; and column 5, lines 5 – 10 and lines 20 – 25);

restricting an amount of light incident (via "iris 2" and "iris control signal" from AE circuit 13) on the sensor elements (CCD 3) such that all the output voltage of the sensor elements reside only within a substantially linear range of the graph (see explanation below).

The Examiner submits the claim language is written broadly in at least two respects:

1) The claim language "known plurality of light intensities" is written broadly enough such that *what or who or when or how* the light intensities are known and known with respect to is not specified. The CCD (3) of Kawai et al. is a device that converts impinging radiation (e.g.,

light) into electric charges for conversion by the camera into an image. In this respect, the CCD of Kawai et al. has maximum allowable range of accumulated charges per sensor element before reaching saturation, wherein the quantity of charges represents a plurality of light intensities. For this reason, Kawai et al. sufficiently disclose "known plurality of light intensities" as claimed.

2) The claimed word "substantially" is a broad term. Accordingly, the claimed phrase "substantially linear range" does not require that all portions of the graph be exclusively linear. Rather, the claim language requires that the graph is *mostly linear*. The Examiner considers the graphs of figures 3 – 6 of Kawai et al. to be *mostly linear* – hence, "substantially linear". Accordingly, the output voltages of the sensor elements of the CCD (3) would indeed reside only in a "substantially linear range" of the graph. For this reason, Kawai et al. sufficiently disclose this limitation, as claimed.

The Examiner notes Kawai et al. disclose, "The output compressed by the KNEE circuit 8 is supplied as 8-bit data to match a signal processing circuit 9, which performs image operation processing at a resolution of 8 bits ... The output signal from the signal processing circuit 9 is output as a color video signal, and is also input to an AE circuit 13 ... The AE circuit 13 generates an iris control signal for controlling the iris, and supplies a shutter speed control signal for controlling clocks for driving the CCD to a clock generation circuit 14", (see column 4, lines 10 – 18).

Based upon the teaching of Kawai et al., the Examiner submits that Kawai et al. first performs either non-linear KNEE compression (see column 4, lines 10 – 18) or linear KNEE compression (see column 6, lines 11 – 24) and then subsequently performs exposure control via

the iris (see column 4, lines 10 – 18) for the purpose of widening the dynamic range of the image (see column 1, lines 39 – 42).

While Kawai et al. disclose a method of exposing, graphing, and restricting, as stated above; Kawai et al. do not disclose establishing a camera offset equal to the output voltage of the camera when substantially no light falls on the sensor elements.

On the other hand, Sakai et al. also disclose a method for compensating real camera characteristics. More specifically, Sakai et al. disclose, in accordance with figures 1 and 2 and column 4 (line 29) – column 5 (line 49), an image capturing/processing apparatus that at least includes a shutter (2) and a photoelectric conversion unit (3), which includes a plurality of pixels. Furthermore, Sakai et al. disclose that when a user operates a release button, the shutter (2) is opened and the plurality of pixels of the photoelectric unit (3) captures an image of the subject that has passed through the lens (1) and the opened shutter (2). After the image of the subject has been captured, the shutter (2) is closed, such that light passing through the lens does not pass through the shutter (2) to the photoelectric conversion unit (3); hence, allowing the photoelectric conversion unit (3) to capture a dark image that represents noise. The noise capturing operation, while the shutter is closed, is repeated two or more arbitrary times such that a plurality of dark images are captured so that an averaged dark image can be calculated to represent the average noise of the photoelectric conversion unit (3). The averaged dark image is an "offset" that is subtracted the subject image to produce a final image with reduced noise.

Sakai et al. captures a plurality of *optical black* (dark frames) and averages them to determine the *actual* (most accurate) representation of the camera output voltage (see column 4, lines 31 – 58). Essentially, Sakai et al. use the camera offset to reduce fixed pattern noises and

virtually eliminate random noises by calculating the output voltage of the camera (see column 1, lines 31 – 35 and column 5, lines 43 – 49). Clearly, Sakai et al. teach establishing a camera offset equal to the output voltage of the camera when substantially no light falls on the sensor elements.

Thus, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included establishing a camera offset equal to the output voltage of the camera when substantially no light falls on the sensor elements (as taught by Sakai et al.) in the method of calibrating a color monitoring system (disclosed by Kawai et al.) for the advantage of *reducing fixed pattern noises without increasing random noises* (see Sakai et al.; column 1, lines 30 – 35).

17. As for **Claim 2**, Sakai et al. teach, as stated in column 4 (lines 10 – 30), that when a user operates a release button, the shutter (2) is opened and the plurality of pixels of the photoelectric unit (3) captures an image of the subject that has passed through the lens (1) and the opened shutter (2). After the image of the subject has been captured, the shutter (2) is closed, such that light passing through the lens does not pass through the shutter (2) to the photoelectric conversion unit (3); hence, allowing the photoelectric conversion unit (3) to capture a dark image that represents noise. Therefore, Sakai et al. teach that the offset is established on a periodical basis to keep pace with the variations in offset value caused by variation in ambient condition (i.e., conditions at the time of shutter press, or image capture).

18. As for **Claim 3**, Sakai et al. teach, as stated in column 4 (lines 10 – 30), that when a user operates a release button, the shutter (2) is opened and the plurality of pixels of the photoelectric unit (3) captures an image of the subject that has passed through the lens (1) and the opened

shutter (2). After the image of the subject has been captured, the shutter (2) is closed, such that light passing through the lens does not pass through the shutter (2) to the photoelectric conversion unit (3); hence, allowing the photoelectric conversion unit (3) to capture a dark image that represents noise. Therefore, Sakai et al. teach that the step of establishing offset is carried out whenever an image capture operation for capturing a desired image to be monitored is to be carried out.

19. As for **Claims 4 – 8** (please see 112, 2nd paragraph rejection above), Sakai et al. teach, as stated in column 4 (lines 10 – 30), that when a user operates a release button, the shutter (2) is opened and the plurality of pixels of the photoelectric unit (3) captures an image of the subject that has passed through the lens (1) and the opened shutter (2). After the image of the subject has been captured, the shutter (2) is closed, such that light passing through the lens does not pass through the shutter (2) to the photoelectric conversion unit (3); hence, allowing the photoelectric conversion unit (3) to capture a dark image that represents noise. The dark or black image captured by Sakai et al. is an image of zero light intensity (Claim 5).

Sakai et al. do not teach obtaining the zero light intensity by: closing the iris of the camera (Claim 4); or extrapolating measurements obtained form imaging black and white references tiles in the image field itself (Claims 6 – 8).

However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of setting a zero light intensity by closing an iris of the camera or by providing black and white reference tiles in the image field are well known and expected in the art. At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have set a zero light intensity by closing an iris of the camera or by providing black and white

reference tiles in the image field in the method of camera calibration (taught, in combination, by Kawai et al. in view of Sakai et al.) for advantage of *ensuring the subject has proper color balance such that the subject can be reproduced precisely in an image display unit without being affected by the color characteristic of the camera.*

20. As for **Claim 9** (please see claim objection above), while Kawai et al. in view of Sakai et al. teach providing a black reference representing known zero light specifically when no light is allowed to impinge upon the image sensor; Kawai et al. in view of Sakai et al. do not disclose providing a white reference representing know maximum light (saturation) in the image field via a white reference tile.

However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of providing a white reference representing know maximum light (saturation) in the image field via a white reference tile are well known and expected in the art. At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have provided a white reference representing know maximum light (saturation) in the image field via a white reference tile for advantage of *ensuring the subject has proper color balance such that the subject can be reproduced precisely in an image display unit without being affected by the color characteristic of the camera.*

21. As for **Claim 10** (please see 112, 2nd paragraph rejection above), Kawai et al. disclose, as shown in figure 2A and as stated in column 4 (lines 12 – 17), wherein restricting the amount of light incidence on the sensor elements is performed by closing an iris (2) of the camera.

22. As for **Claim 11** (please see 112, 2nd paragraph rejection above), Kawai et al. disclose, as shown in figure 2A and as stated in column 4 (lines 12 – 17), wherein the iris is restricted so as

to give an appropriate camera output voltage, which is a proportion of a full scale value (see figures 3 – 5).

23. As for **Claim 12** (please see 112, 2nd paragraph rejection above), Kawai et al. disclose, , as shown in figure 2A and as stated in column 4 (lines 12 – 17), wherein restriction of the iris is arranged to ensure that a perfect white reflector registers at the top of the linear region and to then scale (see figure 3 – 5; the closing of the iris 2 further guarantees that the "end point" will not saturate at the top of the scale.).

24. As for **Claim 13** (please see 112, 2nd paragraph rejection above), Kawai et al. disclose, as shown in figure 2A and as stated in column 5 (line 65) – column 6 (line 24), using a plurality of image information to perform the processing, including: the current image frame, the previous image frame, or a combination of image frames. Accordingly, the disclosure of Kawai et al. and Sakai et al. include establishing the offset as frequently as the graphing.

25. As for **Claim 14** (please see 112, 2nd paragraph rejection above), the Examiner notes that the claim language is written broadly enough such a plurality of print runs directly corresponds to a plurality of image captures. Moreover, Kawai et al. disclose, as shown in figure 2A and as stated in column 5 (lines 65 – 67), that the calibration process (e.g., KNEE compression and iris control) is carried out for every image capture.

26. As for **Claim 15** (please see 112, 2nd paragraph rejection above), the Examiner notes that the claim language is written broadly enough such a plurality of print runs directly corresponds to a plurality of image captures. Moreover, Kawai et al. disclose, as shown in figure 2A and as stated in column 5 (lines 65 – 67), that the calibration process (e.g., KNEE compression and iris control) is carried out for every image capture and every plurality of image captures.

Conclusion

27. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Justin P Misleh whose telephone number is 571.272.7313. The Examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Vivek Srivastava can be reached on 571.272.7304. The fax phone number for the organization where this application or proceeding is assigned is 571.273.8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Justin Misleh
Examiner, GAU 2622
April 2, 2007